

**UNITED STATES OF AMERICA**  
**NUCLEAR REGULATORY COMMISSION**  
**ATOMIC SAFETY AND LICENSING BOARD**

In the Matter of SMR, LLC (Pioneer Units 1 and 2)  
Docket Nos. 50-616 and 50-617  
NRC-2026-0265  
Submitted pursuant to 10 CFR § 2.309 March 30, 2026

Office of the Secretary  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001  
Attention: Rulemakings and Adjudications Staff

Re: Petition for Leave to Intervene and Request for Adjudicatory Hearing  
SMR, LLC Pioneer Units 1 and 2  
Docket Nos. 50-616 and 50-617  
NRC-2026-0265

The Petitioner has twelve years of experience in product lifecycle management and regulatory compliance. The discipline requires full product lifecycle planning and confirmation of completed prerequisites before any complex system is approved for deployment, a complete accounting of what the system does across its full operational life, identification of failure modes the designers did not address, and mapping of those failure modes against the applicable regulatory standard to confirm resolution prior to deployment authorization. The SMR-300 has a 40-year operating license and a 24,110-year product lifecycle and physical liability period under ANS/ANS-5.1-2014, the NRC's

own decay heat standard. The Environmental Report submitted with this application addresses the licensed period. It does not address the liability period and full product lifecycle. The difference is 24,070 years. Petitioner applied standard pre-deployment risk methodology to the SMR-300 design and documented the findings in Walker (2026), "The Thermodynamic Effects of Nuclear Fission in the Great Salt Lake Basin," received March 12, 2026, published March 27, 2026, *Journal of Nuclear Energy, Part A: Nuclear Physics*, 2026, 1, 1.5, DOI: 10.5281/zenodo.15001852, attached as Exhibit A. The contentions that follow are the regulatory translation of that analysis. Each identifies a specific gap between what the applicable standard requires and what the applicant has demonstrated. The Board is not being asked to resolve scientific disputes. It is being asked to require the applicant to demonstrate compliance with existing standards across the timeline the product they are deploying actually creates.

## **STANDING BASIS**

Petitioner's standing to intervene arises from the following documented basis. Petitioner resides in Utah, where the Holtec SMR-300 has been selected for deployment under Operation Gigawatt, a multi-reactor program proposed for the Great Salt Lake basin. In assessing the SMR-300 design as it applies to that deployment, Petitioner identified design-level deficiencies that are not site-specific. They arise from

the reactor's physical characteristics and apply to any SMR-300 deployment, including Pioneer Units 1 and 2.

The deficiencies identified in this petition fall into two categories. The first category consists of design-level deficiencies that attach to the SMR-300 regardless of siting location, including the seismic design basis, the categorical exclusion duration, the instrumentation and control materials obligations, the post-shutdown financial assurance gap, and the cybersecurity supply chain hardware vulnerability. The second category consists of site-specific deficiencies at the Palisades location that establish the environmental and safety analysis framework the NRC will apply to future SMR-300 construction permit proceedings. A construction permit issued without resolving either category establishes regulatory precedent applicable to all subsequent SMR-300 deployments including Utah. Petitioner has a direct and concrete interest in the adequacy of both.

The application's own filings confirm that the deficiencies identified in this petition are unresolved at the time of filing. Each factual basis stated in the contentions that follow is sourced to the applicant's own documents.

Petitioner's injury is the application of an inadequate regulatory precedent to a reactor deployment in the jurisdiction where Petitioner resides. That injury is traceable to this proceeding and redressable by the relief requested herein. The applicant has requested

LWA issuance by December 31, 2026, with construction of the containment vessel and spent fuel pool walls scheduled to begin in 2027 before the full construction permit issues, as stated in Enclosure I, Section 2.1.3 of this application. The regulatory precedent this proceeding establishes will be set before those structures are in the ground. Petitioner's injury is imminent and concrete, not speculative.

## **WHAT THIS PETITION CONTAINS**

This Petition presents twelve contentions. Each identifies a specific gap between what the applicable regulatory standard requires and what the applicant has demonstrated. Each is supported by reference to specific portions of the application, applicable regulatory requirements, NRC regulatory standards, published scientific literature, USGS supply chain data, or federal agency records. Exhibit A is incorporated by reference and provides the quantitative foundation for Contentions 2, 3, 4, and 5.

The Environmental Report (ADAMS Accession No. ML25365A988), Revision 0, December 2025, Master Table of Contents at pages ii through iv, contains four chapters addressing introduction, site description, plant description, and construction impacts. It contains no chapter addressing operational environmental impacts, cumulative impacts, or decommissioning. The Preliminary Safety Analysis Report (ADAMS Accession No. ML25365A987) contains nineteen chapters of which eleven are marked Reserved and contain no content, including Chapter 7 Instrumentation and Controls, Chapter 15

Accident Analysis, Chapter 16 Technical Specifications, and Chapter 19 Probabilistic Risk Assessment. The contentions that follow document the regulatory obligations that attach to this product's full physical commitment and that are not addressed in either document.

Holtec states the SMR-300 is a standardized design that does not require site-specific revision. A design which makes that claim must demonstrate its seismic basis envelopes the maximum credible hazard at every site where it is deployed. The publicly available record does not contain that demonstration for Central and Eastern United States probabilistic seismic hazard analysis using CEUS-SSC and NGA-East models as Regulatory Guide 1.208 requires. The burden of that demonstration rests with the applicant. The categorical exclusion duration gap is arithmetic: 40 years is 0.17 percent of 24,110 years. Instrumentation and control materials depletion is documented in USGS Mineral Commodity Summaries and confirmed by China's April 2025 rare earth export suspension orders. The coastal erosion deficiency is documented in NRC's own licensing records for this site. Great Lakes Compact water withdrawal compliance has not been demonstrated on the public record. The cumulative environmental impact of three concurrent nuclear operations at this site is not addressed in the Environmental Report.

Prior to the publication of Exhibit A, no party to this proceeding had performed a thermodynamic analysis of cumulative SMR-300 waste heat obligations across its full physical liability period, or a seismic analysis of the standardized design basis against the

full range of environments in which it is proposed for deployment. This petition asks the Board to require the applicant to demonstrate compliance with existing standards across the timeline and deployment environments this product actually creates.

### **RELIEF REQUESTED**

Petitioner requests that the Atomic Safety and Licensing Board admit this petition, recognize Petitioner's standing on the bases stated above, admit the contentions set forth herein, and order the specific relief identified at the conclusion of each contention.

Respectfully submitted,

Signed (electronically) by:

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*Exhibit A: Walker, J. (2026). The Thermodynamic Effects of Nuclear Fission in the Great Salt Lake Basin. Januarian Physics, 2026, 1, 1.5. DOI: 10.5281/zenodo.15001852. Attached.*

## CONTENTIONS

The following twelve contentions are submitted pursuant to 10 CFR § 2.309(f)(1). Each contention identifies a specific and material dispute with the application. Each is supported by reference to specific portions of the application, applicable regulatory requirements, or both. Exhibit A is incorporated by reference throughout.

Each contention is identified by title. The regulatory standard at issue, the factual basis for the dispute, and the relief required are stated within each contention. The Board is not asked to resolve scientific disputes. It is asked to require the applicant to demonstrate compliance with standards that already exist, applied to the timeline and deployment environments this product actually creates.

**CONTENTION 1: SEISMIC DESIGN BASIS IS UNDEMONSTRATED FOR SITE**

*Regulatory basis: 10 CFR § 100.23; NRC Regulatory Guide 1.208; 10 CFR Part 50 Appendix S*

Holtec states the SMR-300 is a bounding standardized design whose design will not have to be revised for each new site. That claim has one implication: the 0.5g peak ground acceleration design basis must envelope the maximum credible seismic hazard at every deployment site. The publicly available record does not contain that demonstration for this site. Regulatory Guide 1.208 requires site-specific probabilistic seismic hazard analysis using CEUS-SSC seismic source characterization and NGA-East ground motion prediction equations for eastern US sites. NGA-West2, calibrated on western US data, does not satisfy this requirement. The Palisades site sits within seismic influence of the New Madrid Seismic Zone, approximately 550 km southwest, capable of M 7.5-8.0, and the Wabash Valley Seismic Zone, approximately 350 km southwest, capable of M 6.5-7.5 with an incompletely characterized paleoseismic record. Eastern US craton transmits seismic energy two to three times further than equivalent western US events. Site stratigraphy compounds the deficiency. NRC licensing records confirm the Palisades site is underlain by loose sand dunes and 150 to 500 feet of glacial deposits above bedrock at elevation 440 feet. The SMR-300 embeds its below-grade containment in this stratigraphy. Exemption 1, Enclosure IV (ADAMS Accession No. ML25365A989), Section 1.3.1, confirms the nuclear island excavation extends to 100 feet below working grade through

those glacial deposits. Section 1.3.4 of the same enclosure states that soil-structure interaction analysis accounting for the permanent excavation walls will be performed in the future, confirming that analysis is not complete at the time of filing. Ground motion amplification through 150 to 500 feet of glacial overburden on an actively eroding shoreline has not been published by the applicant for the Pioneer Units foundation depth. A standardized design basis derived from western US ground motion data, applied without site-specific amplification analysis to this stratigraphy, is not a bounding demonstration under any reading of Regulatory Guide 1.208.

The SSI Analysis Methodology topical report governing this analysis was not approved before this application was filed. The applicant's own Regulatory Engagement Plan projected that topical report for Mid 2025 submittal and it had slipped to concurrent December 2025 filing without NRC approval. Three years of seismic methodology engagement between Holtec and NRC staff did not produce an approved site-specific analysis using CEUS-SSC and NGA-East models before this proceeding was initiated.

The burden of that demonstration rests with the applicant.

**Required****remedy:**

Site-specific probabilistic seismic hazard analysis using CEUS-SSC and NGA-East models with site amplification factors derived from documented Palisades stratigraphy,

demonstrating 0.5g envelopes 84th-percentile ground motion from New Madrid and Wabash Valley sources at Pioneer Units foundation depth, filed prior to LWA approval.

## **CONTENTION 2: THE CATEGORICAL EXCLUSION COVERS 0.17 PERCENT OF THE PROJECT**

*Regulatory basis: NEPA 42 U.S.C. § 4332(2)(C); 40 CFR § 1501.4; 40 CFR § 1508.1(g); 10 CFR § 51.45; DOE 10 CFR Part 1021 Subpart D*

The DOE categorical exclusion signed January 28, 2026, published at 91 Fed. Reg. 7736 under Docket DOE-HQ-2025-0405, was issued for what it characterized as an advanced nuclear reactor deployment. Under ANS/ANS-5.1-2014, the NRC's own decay heat standard, post-shutdown decay heat from a dual-unit SMR-300 requires active cooling for 24,110 years. The 40-year operating license is 0.17 percent of that commitment. The exclusion addresses none of the remaining 99.83 percent.

A categorical exclusion does not apply where extraordinary circumstances give an action the potential for significant environmental effects. 40 CFR § 1501.4. A federal commitment whose reasonably foreseeable physical consequences extend 24,110 years is not categorically excludable under any reading of that standard. Twelve state attorneys general filed formal opposition to this exclusion on March 4, 2026. The NRC's Environmental Report obligation under 10 CFR § 51.45 is independent of and not discharged by the DOE categorical exclusion.

The NRC cannot rely on a DOE exclusion to satisfy its own NEPA obligations. NEPA requires analysis of all reasonably foreseeable environmental effects including effects occurring later in time. 40 CFR § 1508.1(g). The Environmental Report addresses the licensed period, but it does not address the physical liability period. That failure of scope is confirmed on the face of the application. The Environmental Report (ADAMS Accession No. ML25365A988), Revision 0, December 2025, Master Table of Contents at pages ii through iv, contains four chapters. Chapter 4 is titled Environmental Impacts from Construction. There is no chapter addressing operational environmental impacts, no chapter addressing post-shutdown thermal obligations, and no chapter addressing decommissioning environmental impacts. The licensed period scope is confirmed on the face of the document. The difference between what the Environmental Report covers and what the physical commitment requires is 24,070 years.

The pre-application environmental engagement record confirms this omission was deliberate. The SMR-300 Regulatory Engagement Plan, Revision 6 (ADAMS Accession No. ML25272A265), Appendix A, records environmental engagement in April 2024, February 2025, and April 2025. None of those engagements addressed operational thermal discharge impacts, post-shutdown decay heat obligations, or the physical liability period. The scope limitation was established during pre-application engagement and carried into the filed document without resolution.

**Required remedy:**

Supplemental Environmental Report sections addressing thermal, hydrological, and institutional obligations through the full ANS/ANS-5.1-2014 decay timeline prior to construction permit issuance.

### **CONTENTION 3: SAFETY-CRITICAL MATERIALS FACE DOCUMENTED SUPPLY EXHAUSTION WITHIN THE REACTOR LIFETIME**

*Regulatory basis: 10 CFR § 50.36 Technical Specifications; 10 CFR § 50.65 Maintenance Rule*

10 CFR § 50.36 requires Technical Specifications ensuring operability of safety systems. 10 CFR § 50.65 requires demonstrated ability to maintain safety-related structures, systems, and components. Neither obligation can be met for systems whose critical material inputs face documented supply exhaustion within the licensed period.

Exhibit A documents, using USGS Mineral Commodity Summaries data, that 14 of 50 instrumentation and control materials critical to SMR-300 operation are projected to reach global supply exhaustion before the first operating license expires. Dysprosium and terbium, essential to reactor sensor magnets operating above 150 degrees Celsius, face projected supply deficit by 2035. Gadolinium, which has no functional substitute in control rod applications due to its 49,000-barn neutron capture cross-section, was included in China's April 2025 rare earth export suspension alongside six additional elements critical to reactor instrumentation and control. China processes 90 to 100 percent of global heavy rare earth supply.

The application does not address this obligation. The Preliminary Safety Analysis Report (ADAMS Accession No. ML25365A987), Chapter 16, Technical Specifications, is marked

Reserved and contains no content. The PSAR (ADAMS Accession No. ML25365A987), Chapter 7, Instrumentation and Controls, is also marked Reserved and contains no content. The 10 CFR § 50.36 Technical Specifications obligation and the 10 CFR § 50.65 Maintenance Rule obligation cannot be evaluated against a document that has reserved both relevant chapters in their entirety.

The approved Quality Assurance Program, Topical Report HI-2230815-A, Revision 2 (ADAMS Accession No. ML24248A162), accepted by NRC on August 26, 2024, Part II, Section 4, Procurement Document Control, requires that procurement documents invoke applicable technical and quality requirements for purchased items and services. The program contains no requirement that procurement documents address material availability projections, supply exhaustion timelines, or reserve stock assurance for safety-critical materials across the licensed period. The program contains no provision requiring reassessment when government export restrictions create new supply chain vulnerabilities. The program was approved eight months before China's April 2025 export suspension and contains no controls applicable to that class of supply chain disruption.

Under ANS/ANS-5.1-2014, decay heat removal requires functioning instrumentation and control systems for 24,110 years post-shutdown. Materials projecting supply exhaustion within a single human lifetime cannot satisfy a 24,110-year operational obligation.

**Required remedy:**

A materials supply assurance program as a license condition demonstrating availability of all safety-critical instrumentation and control materials for the full reactor lifetime, defined as the 40-year operating license plus the ANS/ANS-5.1-2014 post-shutdown decay heat monitoring period, filed prior to construction permit issuance.

**CONTENTION 4: NO FINANCIAL ASSURANCE FRAMEWORK EXISTS FOR THE  
POST-SHUTDOWN THERMAL OBLIGATION**

*Regulatory basis: 10 CFR § 50.75 Decommissioning Funding; 10 CFR § 72.30 Spent Fuel*

*Financial Assurance; NUREG-1573*

10 CFR § 50.75 requires demonstrated financial assurance for decommissioning. That framework covers facility dismantlement. It does not cover the post-shutdown decay heat removal obligation, which under ANS/ANS-5.1-2014 requires active water cooling, functioning instrumentation, trained operators, and continuous institutional funding for 24,110 years beyond shutdown.

No financial instrument currently exists that covers a 24,110-year operational obligation.

No human institution, governmental, corporate, or otherwise, has maintained operational continuity for 24,110 years. The commitment being made in this proceeding binds generations not party to it to a maintenance obligation for which no regulatory framework exists beyond the 40-year licensed period.

The spent fuel financial assurance framework under 10 CFR § 72.30 addresses storage costs. It does not address the cost of active decay heat removal infrastructure, trained operators, institutional continuity, and continuous water supply for 24,110 years. Neither 10 CFR § 50.75 nor 10 CFR § 72.30 covers this obligation. The applicant has identified no

instrument that does. The gap between what both frameworks together cover and what this product requires is 24,070 years of funded, staffed, and supplied decay heat removal with no instrument to secure it. The application's own filings confirm this gap at every level. Palisades SMR, LLC, the licensed entity, has no assets as of the application date, as stated in Enclosure I, Section 2.1.1. The total project cost is withheld in its entirety from the public record in Table 2-2 of Enclosure I. The parent company balance sheet is withheld in its entirety in Table 2-3 of Enclosure I. The primary financing vehicle, a DOE Title XVII loan guarantee, has not been issued, as confirmed in Enclosure I, Section 2.2.2, which states the applicant is preparing to submit its Part II loan application. Enclosure III, Exemption 3 (ADAMS Accession No. ML25365A989), Section 3.1, confirms the applicant has requested exemption from the standard financial qualification demonstration under 10 CFR § 50.33(f)(1) and 10 CFR Part 50 Appendix C because it cannot identify specific sources of construction funding at this stage.

Enclosure V, Proposed License Conditions (ADAMS Accession No. ML25365A989), page 1-1, contains the complete and entire set of proposed license conditions for Pioneer Units 1 and 2. It proposes one license condition. That condition requires notification to NRC prior to commencement of limited construction scope and prior to commencement of full construction scope. Both milestones address construction financing. Neither addresses post-construction operational funding, post-shutdown decay heat removal infrastructure, spent fuel cooling continuity, or any financial obligation arising after

construction completion. The applicant's own proposed license conditions confirm that no binding financial commitment to the post-shutdown obligation exists in this application, is proposed to exist as a condition of the license or will be required before construction begins.

**Required remedy:** Prior to construction permit issuance, the applicant must identify the specific existing regulatory instruments under which financial assurance for post-shutdown decay heat removal will be demonstrated for the full ANS/ANS-5.1-2014 timeline and demonstrate that those instruments are commensurate with the obligation. If no such instruments exist, that absence is a material deficiency in the application that must be resolved before a construction permit issues.

**CONTENTION 5: THERMAL DISCHARGE IMPACTS ON LAKE MICHIGAN ARE INADEQUATELY ANALYZED**

*Regulatory basis: 10 CFR § 51.45 Environmental Report; Clean Water Act § 316(a); NEPA 40 CFR § 1508.1(g)*

The dual-unit Pioneer configuration rejects 1,380 MW of waste heat continuously at 92 percent capacity factor. Holtec's Environmental Report states the two reactors will withdraw 25,000 gallons per minute, up to 36 million gallons per day, from Lake Michigan. Lake Michigan is the primary drinking water source for approximately 12 million people and the ecological foundation of a \$7 billion Great Lakes fishery.

Clean Water Act § 316(a) requires applicants to demonstrate that thermal discharge will not adversely affect a balanced indigenous population of fish, shellfish, and wildlife. The Environmental Report does not contain that demonstration. It does not address cumulative thermal loading on Lake Michigan water temperature, dissolved oxygen, or aquatic habitat through the decay timeline. Decay heat requires active water cooling for 24,110 years under ANS/ANS-5.1-2014. That cooling rejects heat into Lake Michigan throughout. The reasonably foreseeable thermal effects on the receiving water body have not been analyzed.

That absence is confirmed on the face of the application. The Environmental Report (ADAMS Accession No. ML25365A988), Section 2.2.3, establishes baseline water quality conditions for Lake Michigan at the site. The Clean Water Act § 316(a) demonstration of thermal discharge impacts on those baseline conditions does not appear in any chapter of the document. Chapter 4 addresses environmental impacts from construction only. No corresponding chapter addressing environmental impacts from operation exists in the document. The withdrawal figures appear in Section 2.2.2 at page 2.2-11. The analysis of what those withdrawals and that thermal discharge do to the receiving water body does not appear anywhere.

**Required remedy:** Quantified thermal discharge analysis addressing Lake Michigan water temperature, dissolved oxygen, and aquatic habitat impacts through the full ANS/ANS-5.1-2014 decay timeline, filed prior to construction permit issuance.

## **CONTENTION 6: COASTAL EROSION AND SHORELINE STABILITY ARE UNADDRESSED**

*Regulatory basis: 10 CFR § 100.23; 10 CFR Part 50 Appendix A GDC-2*

General Design Criterion 2 requires structures to withstand the most severe natural phenomena at the site. The Palisades site is located on an actively eroding Lake Michigan shoreline. NRC licensing records confirm that coastal erosion at this site has already caused structures to fall into Lake Michigan. Lake Michigan water levels fluctuated by more than six feet within the past decade, recording historic highs in 2020.

The SMR-300 embeds its below-grade containment in ground that is actively eroding toward an open freshwater lake. Exemption 1, Enclosure IV (ADAMS Accession No. ML25365A989), Section 1.3.3, confirms a 3,875-foot perimeter cutoff wall keyed into the underlying glacial clay will permanently enclose the SMR construction area as a groundwater barrier. Section 1.7.1.2 of the same enclosure acknowledges that the below-grade structures are expected to be installed into the water table. Exemption 2, Enclosure IV, Section 2.2, confirms that construction of the containment vessel and spent fuel pool walls will proceed before the full construction permit issues, with acknowledged risk that NRC may identify safety concerns requiring remediation after construction has begun. The shoreline stability analysis required by GDC-2 has not been completed before these

permanent structures begin to be embedded in the actively eroding stratigraphy this contention addresses.

The LWA application does not contain a site-specific analysis of shoreline stability over the 40-year operational period. It contains no analysis of shoreline stability over the 24,110-year decay timeline during which the below-grade containment must remain structurally intact. The Environmental Report (ADAMS Accession No. ML25365A988), Section 2.2.1, addresses site hydrology as a baseline characterization only. Section 2.3.2 addresses aquatic ecology as a baseline characterization only. Neither section contains a stability analysis. No chapter of the Environmental Report addresses operational shoreline conditions. A below-grade containment structure embedded in an actively eroding shoreline with documented structural loss history does not satisfy GDC-2 without a site-specific stability demonstration. That demonstration is absent from the public record.

**Required remedy:** Site-specific shoreline stability analysis demonstrating GDC-2 compliance over the operational period and post-shutdown decay timeline, accounting for documented erosion rates and Lake Michigan water level variability, filed prior to LWA approval.

**CONTENTION 7: CUMULATIVE RADIOLOGICAL RISK FROM SPENT FUEL STORAGE ON AN ERODING GREAT LAKES SHORELINE IS UNANALYZED**

*Regulatory basis: 10 CFR § 50.54(hh); post-Fukushima Order EA-12-049; NEPA 40 CFR § 1508.1(g)*

The Palisades site currently stores 49 dry casks containing 869 metric tons of spent nuclear fuel on a concrete pad on an actively eroding Lake Michigan shoreline. The Pioneer Units would add two SMR-300 spent fuel pools and additional dry cask inventory to this site. The SMR-300 locates its spent fuel pool inside below-grade containment, embedded in the same stratigraphy documented in Contention 1 as subject to active coastal erosion and 150 to 500 feet of glacial overburden.

The International Joint Commission's Great Lakes Water Quality Board has formally called for nuclear operators and regulators to plan for coastal climate impacts when designing and locating spent fuel storage facilities. NOAA modeling for this site has been documented as failing to address whether existing shoreline protection infrastructure is structurally sound. Lake Michigan water levels fluctuated by more than six feet within the past decade, recording historic highs in 2020.

The absence of cumulative radiological risk analysis is confirmed on the face of the application. The Environmental Report (ADAMS Accession No. ML25365A988), Section

2.9, establishes radiological baseline monitoring data through Section 2.9.6 and describes the proposed Radiological Environmental Monitoring Program for Pioneer Units in Section 2.9.8. The baseline data exists. The analysis of cumulative radiological risk from the existing 869 metric ton inventory combined with Pioneer spent fuel storage under the documented erosion and lake level conditions does not exist in any chapter of the document. The Master Table of Contents at pages ii through iv contains no chapter addressing cumulative radiological risk, post-shutdown spent fuel storage adequacy, or structural integrity of below-grade containment under coastal erosion conditions. That analysis is absent from the public record.

Exemption 2, Enclosure IV (ADAMS Accession No. ML25365A989), Table 2-1, confirms that the spent fuel pool walls are among the safety-critical structures authorized for construction before the full construction permit issues. Section 2.2 of the same enclosure acknowledges that NRC may identify safety concerns requiring remediation after construction has begun. The cumulative radiological risk analysis required by post-Fukushima Order EA-12-049 has not been completed before the spent fuel pool walls begin to be embedded in the actively eroding stratigraphy this contention addresses.

**Required remedy:** Cumulative radiological risk analysis for all spent fuel storage at the Palisades site under the full ANS/ANS-5.1-2014 decay timeline, incorporating

documented erosion rates, Lake Michigan water level variability, and below-grade containment structural adequacy, filed prior to construction permit issuance.

## **CONTENTION 8: AGRICULTURAL AND FOOD SUPPLY IMPACTS ARE UNANALYZED**

*Regulatory basis: NEPA 42 U.S.C. § 4332; 40 CFR § 1508.1(g); Farmland Protection Policy Act 7 U.S.C. § 4201; Council on Environmental Quality Farmland Guidance*

Lake Michigan's thermal mass produces a peer-reviewed and documented moderating effect on surrounding terrestrial agriculture that created Michigan's western fruit belt and makes fruit cultivation farther inland non-viable due to spring frost exposure without lake moderation. This effect is directly dependent on Lake Michigan surface temperature. The Pioneer Units will continuously reject 1,380 MW of waste heat into Lake Michigan at 92 percent capacity factor. The Environmental Report does not analyze the impact of that thermal discharge on Lake Michigan surface temperature or the downstream agricultural moderating effect.

Van Buren County contains 838 farms. Approximately 6,362 farms operate within 50 miles of the site. Michigan's southwestern shoreline produces the majority of the state's fruit crop, including a nationally significant blueberry industry whose growing season is directly dependent on the lake's thermal regulation of spring temperatures.

The Farmland Protection Policy Act, 7 U.S.C. § 4201, requires federal agencies to evaluate impacts on farmland from federal actions. Council on Environmental Quality

implementing guidance applies this obligation to all federal agencies conducting NEPA review, including the NRC in this proceeding. The thermal modification of Lake Michigan surface temperature sufficient to alter the documented agricultural moderating effect is a reasonably foreseeable environmental effect under NEPA distinct from the aquatic impacts addressed in Contention 5. The Farmland Protection Policy Act independently requires that impact to be evaluated. Neither analysis has been performed. Both omissions are present on the face of the Environmental Report and each independently supports admission of this contention.

That absence is confirmed by specific section reference. The Environmental Report (ADAMS Accession No. ML25365A988), Section 2.1.1 at page 2.1-1, addresses land use for site description purposes only. Section 4.1 addresses land use construction impacts only. No Farmland Protection Policy Act evaluation appears in either section or in any chapter of the document. Baseline water quality and withdrawal figures appear in Sections 2.2.2 and 2.2.3. No analysis of thermal discharge impacts on the agricultural system dependent on that thermal mass appears anywhere in the document.

**Required remedy:** Site-specific analysis of thermal discharge impacts on Lake Michigan surface temperature and the documented agricultural moderating effect on regional farmland, together with a Farmland Protection Policy Act evaluation, filed prior to construction permit issuance.

**CONTENTION 9: GREAT LAKES COMPACT WATER WITHDRAWAL****COMPLIANCE IS UNDEMONSTRATED**

*Regulatory basis: Great Lakes-St. Lawrence River Basin Water Resources Compact, Public Law 110-342; Michigan Public Act 181 of 2008; NEPA 40 CFR § 1508.1(g)*

Holtec's Environmental Report states the Pioneer Units will withdraw 25,000 gallons per minute, up to 36 million gallons per day, from Lake Michigan. The Great Lakes-St. Lawrence River Basin Water Resources Compact, enacted as federal law under Public Law 110-342, requires regional review and approval by all eight Great Lakes governors and the provinces of Ontario and Quebec for any new or increased withdrawal exceeding 100,000 gallons per day. The proposed withdrawal exceeds that threshold by a factor of 360.

The withdrawal figures are confirmed at Environmental Report (ADAMS Accession No. ML25365A988), Section 2.2.2, Water Use, at page 2.2-11. Compact approval operates under independent legal authority that NRC licensing cannot satisfy or substitute for. The LWA application does not demonstrate that Compact approval has been obtained or is underway. This is a binary compliance question. Either the required approval has been obtained, or it has not. The public record does not show that approval has been given.

**Required remedy:** Demonstration of Great Lakes Compact approval or documented proof of active regional review prior to LWA approval.

**CONTENTION 10: CUMULATIVE IMPACTS OF THREE CONCURRENT  
NUCLEAR OPERATIONS AT ONE SITE ARE UNANALYZED**

*Regulatory basis: NEPA 40 CFR § 1508.1(g); 10 CFR § 51.45(a)*

The Palisades site will simultaneously host three distinct nuclear operations: the restarted 800 MWe Palisades PWR, the existing independent spent fuel storage installation holding 49 dry casks containing 869 metric tons of spent fuel on an eroding shoreline, and the proposed dual-unit Pioneer SMR-300 plant. The combined thermal discharge, water withdrawal, radiological inventory, and emergency planning zone obligations of all three operations on one site constitute cumulative environmental effects under NEPA and 10 CFR § 51.45(a).

The Environmental Report addresses Pioneer Units 1 and 2 in isolation. It does not analyze the cumulative impact of three concurrent nuclear operations on Lake Michigan water temperature, shoreline stability, radiological risk, or emergency response capacity. That absence is confirmed on the face of the application. The Environmental Report (ADAMS Accession No. ML25365A988), Master Table of Contents at pages ii through iv, contains no section addressing cumulative environmental impacts of concurrent nuclear operations at this site. The document addresses Pioneer Units construction impacts in isolation. NEPA requires that cumulative analysis. It is absent from the public record.

**Required remedy:** Cumulative environmental impact analysis addressing the combined thermal, hydrological, radiological, and emergency planning obligations of all three concurrent nuclear operations at the Palisades site, filed prior to construction permit issuance.

## **CONTENTION 11: CYBERSECURITY PLAN FAILS TO ADDRESS SUPPLY CHAIN HARDWARE VULNERABILITY**

*Regulatory basis: 10 CFR § 73.54 Cybersecurity; NRC Regulatory Guide 5.71; NIST SP 800-161*

10 CFR § 73.54 requires licensees to establish and maintain a cybersecurity program providing high assurance that digital computer and communication systems associated with safety, security, and emergency preparedness functions are protected from cyber-attack. NRC Regulatory Guide 5.71 requires the cybersecurity program to address supply chain risk as a component of the overall security posture. NIST SP 800-161 establishes hardware dependency on a single-nation monopoly supplier under active export restriction as a documented supply chain attack vector within the NRC's cybersecurity framework.

The SMR-300 relies on the MELTAC digital instrumentation and control platform as its reactor protection system. Enclosure I, Section 2.1.4 of this application confirms Mitsubishi Electric Corporation as the MELTAC platform supplier. MELTAC depends on rare earth hardware components subject to active export restriction under China's Ministry of Commerce Order No. 4 of April 2025, which suspended export of seven rare earth elements critical to reactor instrumentation and control, as documented in

Contention 3. China processes 90 to 100 percent of global heavy rare earth supply. A cybersecurity program that does not address this dependency does not provide the high assurance 10 CFR § 73.54 requires.

The supply chain cybersecurity analysis required under 10 CFR § 73.54 and NRC Regulatory Guide 5.71 cannot be found in any location in the public record where it would be expected to appear. The Preliminary Safety Analysis Report (ADAMS Accession No. ML25365A987), Chapter 7, Instrumentation and Controls, is marked Reserved and contains no content. The MELTAC Safety System Digital Platform topical report remains under NRC review as of the application filing date, as confirmed in the SMR-300 Regulatory Engagement Plan, Revision 6 (ADAMS Accession No. ML25272A265), Table 4-2. The approved Quality Assurance Program, Topical Report HI-2230815-A, Revision 2 (ADAMS Accession No. ML24248A162), accepted by NRC on August 26, 2024, contains no commitment to NIST SP 800-161 and no supply chain controls addressing export restriction events. The pre-application cybersecurity engagement with NRC staff was completed in August 2024, eight months before China's April 2025 export suspension, and no subsequent cybersecurity engagement addressing the post-April 2025 supply chain condition appears in the regulatory engagement record. The publicly available record does not contain a supply chain cybersecurity analysis for the MELTAC platform addressing the documented export restriction risk. To the extent

any such analysis exists in non-public or safeguards-protected portions of the application, Petitioner requests access pursuant to the SUNSI procedures established in the February 27, 2026 Federal Register notice for this proceeding, 91 FR 9892, and requests that the Board grant access notwithstanding the March 9, 2026 deadline given that this petition is filed within the April 28, 2026 intervention deadline. The burden of demonstrating that the existing cybersecurity plan satisfies 10 CFR § 73.54 rests with the applicant.

**Required remedy:** Supply chain cybersecurity analysis for the MELTAC platform demonstrating that safety-critical hardware dependencies on single-nation suppliers under active export restriction do not compromise the high assurance standard of 10 CFR § 73.54 and NIST SP 800-161, filed prior to construction permit issuance. If such analysis exists in non-public form, Petitioner requests access pursuant to SUNSI procedures for supplementation of this contention.

## **CONTENTION 12: EMERGENCY PLANNING IS INADEQUATE FOR A THREE-REACTOR CO-LOCATED SITE**

*Regulatory basis: 10 CFR § 50.47; NUREG-0654; post-Fukushima Order EA-12-049; 10 CFR § 51.45*

10 CFR § 50.47 requires that adequate emergency plans exist as a condition of reactor licensing. NUREG-0654 establishes the criteria for adequate emergency planning. Post-Fukushima Order EA-12-049 required licensees to address multi-unit event scenarios following the demonstration at Fukushima Daiichi that single-unit emergency planning assumptions are insufficient when multiple units experience simultaneous beyond-design-basis events.

The Palisades site will host three concurrent nuclear operations: the restarted 800 MWe Palisades PWR, the existing 49-cask independent spent fuel storage installation containing 869 metric tons of spent nuclear fuel, and the proposed dual-unit Pioneer SMR-300 plant. The three operations share the same Lake Michigan ultimate heat sink, the same site boundary, the same emergency planning zone, and the same offsite emergency response infrastructure. The SMR-300 and the Palisades PWR are different reactor designs operated under different licensing bases by entities within the same corporate family.

The LWA application does not contain an emergency planning analysis addressing simultaneous beyond-design-basis events across all three nuclear operations at this site. It does not address the adequacy of the shared ultimate heat sink under simultaneous loss-of-cooling scenarios at both the Palisades PWR and the Pioneer Units. It does not address the emergency response capacity of Van Buren County and surrounding jurisdictions for a three-facility simultaneous event. That absence is confirmed on the face of the application. The Environmental Report (ADAMS Accession No. ML25365A988), Sections 2.4.1 and 2.4.2, establish the demographic and community characteristics of Van Buren County within the emergency planning zone. No section of the Environmental Report contains an analysis of emergency response capacity for simultaneous beyond-design-basis events across the three concurrent nuclear operations at this site. The post-Fukushima regulatory framework established that these scenarios must be analyzed. That analysis is absent from the public record.

The pre-application engagement record confirms that Holtec intends to request an exemption from 10 CFR § 50.47 to substitute the alternative SMR emergency preparedness framework at 10 CFR § 50.160 in lieu of the standard emergency planning requirements. That engagement is documented in the SMR-300 Regulatory Engagement Plan, Revision 6 (ADAMS Accession No. ML25272A265), Appendix A, March 19, 2025 entry, Public Meeting ML25121A270. The 10 CFR § 50.160 framework was developed for isolated single-unit small modular reactor deployments. It was not developed for a site

simultaneously hosting an 800 MWe restarted pressurized water reactor, an independent spent fuel storage installation containing 869 metric tons of spent fuel, and a dual-unit SMR-300 plant. The intended exemption substitutes a single-unit greenfield framework for the most complex multi-unit co-location scenario in the current NRC licensing queue.

**Required remedy:** Multi-unit emergency planning analysis addressing simultaneous beyond-design-basis events across all three nuclear operations at the Palisades site, demonstrating adequate emergency response capacity and ultimate heat sink availability under combined loss-of-cooling scenarios, filed prior to LWA approval.

## CONCLUSION

Petitioner has submitted twelve contentions pursuant to 10 CFR § 2.309(f)(1). Each contention identifies a specific and material dispute with the application supported by reference to applicable regulatory requirements, published scientific literature, federal agency records, or documented supply chain data. Petitioner respectfully requests that the Atomic Safety and Licensing Board admit this petition, recognize Petitioner's standing on the bases stated above, admit each contention set forth herein, and order the specific relief identified at the conclusion of each contention.

Respectfully submitted,

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